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REBUTTAL TESTIMONY OF WILLIAM E. TAYLOR

Prepared on Behalf of Verizon New England Inc.

d/b/a

Verizon Massachusetts

Before the Massachusetts

Department of Telecommunications and Energy

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I. INTRODUCTION AND SUMMARY

Q. What is your name, business address and current position?

A. My name is William E. Taylor. I am Senior Vice President at National Economic Research Associates, Inc. (NERA), head of its telecommunications practice and of its Cambridge office, located at One Main Street, Cambridge, Massachusetts 02142.

Q. Have you testified previously in this Docket?

A. Yes. I filed direct testimony in Phase I of this proceeding on August 28, 2001. My professional qualifications were attached as Exhibit 1 to that testimony.

Q. What is the purpose of your rebuttal testimony?

A. Verizon Massachusetts ("Verizon MA") has asked me to comment on selected economic issues raised in the direct testimonies of David Gabel on behalf of the Office of Attorney General and John W. Mayo on behalf of AT&T.

Q. Please summarize your primary conclusions.

A. My primary conclusions are summarized as follows.

- Contrary to Dr. Gabel's belief, cost is not the only determinant of prices for the residential telecommunications services at issue in this proceeding. The Telecommunications Act of 1996 along with subsequent federal and state regulation opened local exchange markets to competition so that market forces must also be an important determinant of price. Dr. Gabel ignores the fact that legislative and regulatory changes have eliminated all legal and regulatory barriers to entry and that technological changes have transformed the industry. The most effective way to assure that rates "reasonably approximate" those that would be obtained in a competitive market is to allow market forces to determine the rates.

- Verizon MA's proposal does not assume that residential service rates are subsidized and is not dependent upon there being any subsidy. The issue here is not whether services are subsidized but whether the potential for even very modest increases in basic residence rates – a maximum of 5 percent annually as proposed– is in keeping with an efficient outcome.

- Cost causative pricing is a fundamental principle of efficient pricing and dictates that loop costs be recovered by loop rates. Dr. Gabel's belief that loop costs should be recovered from other sources is grounded in his flawed belief that the loop itself is a common cost.

- The basic exchange dial tone service is today, as it was in the past, the least price elastic service of all telecommunications services provided by Verizon. Dr. Gabel's concern that recent competitive activity may have catapulted dial tone line service to a more elastic position than Verizon's usage services ignores the amount of competitive activity that has affected *all* of Verizon's service offerings in Massachusetts.

- Dr. Gabel's embedded cost analysis has no relevance whatsoever to the issues in this proceeding. In particular, such cost measures have no relevance to the concept of 'just and reasonable' as it pertains to the price of telephone services provided under regulatory and current market conditions in Massachusetts.

- Regarding Dr. Mayo's concern about imputation: economic theory is clear regarding the efficient retail price floor. It includes (1) the price the ILEC charges the CLEC for the wholesale input, (2) the ILEC's incremental cost of its retail-stage functions, and (3) the difference between ILEC's incremental costs to supply the wholesale input to itself and to the CLEC. Verizon's proposal is entirely consistent with this approach.

- The economically efficient level of switched access rates is not TELRIC. Even if all contribution to universal service were eventually to be phased out of switched access rates, they would remain obliged to contribute appropriately to the recovery of shared and common costs.

II. VERIZON MA'S PROPOSAL IS ENTIRELY CONSISTENT WITH CURRENT MARKET CONDITIONS IN MASSACHUSETTS

Q. The Attorney General's witness, Dr. Gabel, asserts [at 4] that reasonable rates for regulated utilities have always been judged with reference to cost. Please comment.

A. I disagree. While I have no argument with the notion that the reasonableness of rates for public utilities designated as a natural monopolies, as Dr. Gabel referenced with his footnote 4, *could* be judged with reference to cost,[1] price regulation is superior to rate of return regulation even for firms that are natural monopolies. Price regulation breaks the nexus between prices and accounting costs, thereby providing an incentive for the regulated firm to behave more like a firm in a competitive market. More importantly, this proceeding sets out to determine how the prices of services provided in a more competitive market (not a natural monopoly market) should be determined. The Telecommunications Act of 1996 radically changed the local exchange markets by opening them to robust competition. The Department, the Justice Department and the FCC have found that those market-opening objectives have been successful in Massachusetts. There is far too much competition for the provision of basic residential services in Massachusetts for any reasonable economist to conclude that natural monopoly conditions prevail. For instance, Dr. Gabel discusses in Section 4.3 of his testimony "the increasing availability of substitutes for traditional wireline service." In markets characterized by such competition, forces of demand and supply will determine the *efficient* level of price. Save for the issue of an appropriate price floor, there is no need to judge prices in such markets as reasonable with any reference to cost.

Q. Dr. Gabel asserts [at 5] that it "makes no sense" for the Department to argue that six-year-old cost information "serves no purpose in wholesale rate making while at the same time relying on data over fifteen years old for the purposes of retail rate making." Do you agree?

[1] The 1969 Posner article cited by Dr. Gabel is about the regulation of a 'natural monopoly' and thus its conclusions should not be of interest to the Department in this proceeding.

A. No. According to Section 252 of the 1996 Telecommunications Act, wholesale ratemaking must be cost-based. Thus, the Department must be concerned about estimates of wholesale service costs. There is no such requirement for retail service rates to be "cost-based" in the same way. Indeed, the efficient rate level of a retail service is determined by the interaction between supply and demand in the market. As I discussed in my direct testimony, economic efficiency is enhanced under Verizon MA's proposal because rates under the Plan are more likely to *reflect* the cost of providing services and thus will provide more accurate signals to consumers (regarding the underlying cost of fulfilling their demands) and competitors (regarding entry decisions).

Q. Dr. Gabel asserts [at 5] that the Department should freeze residential rates pending a further investigation of the cost of service. The basis of this recommendation appears to be a belief that otherwise "fundamental regulatory principles" will be violated. Do you agree?

A. No. There is no foundation for a belief that any regulatory principle has been or will be violated. Dr. Gabel asserts two violations: (i) "raising rates absent current supporting cost data" and (ii) "ensuring that rates reasonably approximate what would obtain in a competitive market." These concerns goes hand-in-hand with Dr. Gabel's concern [at 13-14] regarding dial tone service, i.e., that "it is no longer clear that the dial tone line charge is the non-elastic price element." Neither concern is valid.

Dr. Gabel's concern that the cost studies are not current, and his observation [at 14] that the competitive landscape has changed notwithstanding, the relative elasticity values of dial tone and usage services have not changed. Even large changes in the incremental costs of providing residential exchange service and usage services do not affect the conclusion that higher residential exchange prices and lower usage prices increase economic efficiency. Arguing that a cost showing is required prior to changing rates in markets that Dr. Gabel himself characterizes as subject to "the availability of substitutes" is nothing more than a veiled attempt to forestall price changes for virtually all time.

The most effective way to assure that rates "reasonably approximate" those that would be obtained in a competitive market is to allow the market to determine the rates. While it is true that regulation of "natural monopolies" discussed by Dr. Gabel required the regulator

to act in place of the market's determination of a "just and reasonable" outcome, current market conditions in Massachusetts do not warrant such treatment. Implementation of the Telecommunications Act of 1996 clearly signaled that telecommunications services are not provided under natural monopoly conditions. Dr. Gabel ignores the fact that legislative and regulatory changes have eliminated all legal and regulatory barriers to entry and that technological changes have transformed the industry.[2]

III. VERIZON DOES NOT CLAIM THAT RESIDENTIAL RATES ARE SUBSIDIZED BY ACCESS CHARGES

Q. Dr. Gabel asserts [at 6] that Verizon's proposal implicitly assumes that "residential rates are subsidized by access charges." Do you agree?

A. No. Dr. Gabel sets out three assumptions that he claims are "fundamental" to Verizon's proposal. While his assertions provide an opportunity for him to opine about issues that are at best only tangentially relevant to this proceeding, Dr. Gabel's testimony confuses the facts. Verizon MA's proposal does not assume that residential service rates are subsidized and is not dependent upon there being any subsidy. Technically, a service is in receipt of a subsidy if its price does not recover the forward-looking direct costs incurred to provide the service. Ms. Brown's testimony shows that essentially all residential services provided by Verizon are priced in excess of the direct cost required to provide them and thus are not subsidized. The issue here is not whether services are subsidized but whether the potential for even very modest increases in basic residence rates – a maximum of 5 percent annually as proposed– is in keeping with an efficient outcome.

Q. Dr. Gabel further asserts that Verizon's proposal must assume that "loop costs should be recovered through loop rates" and that "loop services are inherently less price elastic than other services." Please comment.

A. I will address each of these issues in more detail later. In summary:

[2] Please see Section III of my Direct Testimony for a more complete discussion of how market conditions in Massachusetts have changed since the days when one might have characterized the provision of telecommunications services as a natural monopoly.

- ✍ Cost causative pricing is a fundamental principle of efficient pricing and dictates that loop costs be recovered by loop rates. Dr. Gabel's belief that loop costs should be recovered from other sources is grounded in his flawed belief that the loop itself is a common cost.

- ✍ The basic exchange dial tone service is today, as it was in the past, the least price elastic service of all telecommunications services provided by Verizon. Dr. Gabel's concern that recent competitive activity may have catapulted dial tone line service to a more elastic position than Verizon's usage services ignores the amount of competitive activity that has affected *all* of Verizon's service offerings in Massachusetts.

IV. THE LOCAL LOOP IS *NOT* A SHARED FACILITY AND ITS COST SHOULD *NOT* BE ALLOCATED

Q. Dr. Gabel contends [at 9-13] that the loop is a shared facility and its costs should not be recovered exclusively from residential rates. Do you agree?

A. No. In making his case, Dr. Gabel disputes the fact that the local loop (which is bundled with local usage and other services to form basic residential service) can be a service in its own right. For example, he states [at 9]: "The loop is not a separate service. It is an input into the production of almost all other telecommunications services." I disagree with this fundamental premise. Consequently, I disagree with Dr. Gabel's subsequent conclusion that the cost of the local loop is a shared cost that should be allocated across other telecommunications services.

Q. From an economic perspective, what is the function of the local loop?

A. The local loop is a facility that provides dial tone that enables an end-user to gain *connectivity* to the public switched telephone network ("network"). The connectivity gained by use of this facility is a pre-condition for being able to receive various forms of *usage* services, e.g., local calling, long distance (toll) calling, Internet calling, Call Waiting and other custom features, voice messaging, etc. That is, the local loop is the single

delivery vehicle used by various providers to bring their usage services to the end-user.[3] This attribute of the loop often leads observers to conclude that the local loop is a shared facility and, hence, a source of shared cost. From an economic perspective, however, the local loop, or network connectivity service, is an "output" service that is demanded in its own right. Therefore, regardless of its many *uses* or *benefits*, it cannot be thought of as an "input" and, most importantly, must be identified with the full cost that is added to the network when a local loop is placed in service.

Q. Do you accept the premise that the local loop is a shared facility whose cost should be allocated to different services?

A. No. This premise is contrary to sound economic principles and based on an incorrect approach to cost recovery processes. Unfortunately, any public policy about cost recovery and pricing for regulated services that is based on that premise would promote economic inefficiency, lead to a wasteful use of society's scarce resources, and distort consumption and production incentives. Indeed, it would reverse the Department's consistent efforts since the mid-1980's to encourage the economic pricing of telecommunications services and ignore the current competitiveness of markets here in Massachusetts.

Q. What economic principle is necessary to guide pricing and cost recovery for telecommunications services offered by multi-service LECs like Verizon MA?

A. The fundamental economic principle for that purpose is *cost causation*. To understand this principle, consider what happens when a consumer expresses a need for a particular service. To meet that need, the supplier of the service must expend productive resources that are within its control. A purchase or sale transaction between the buyer and the seller would only occur if the price (offered by the buyer) were at least compensatory, i.e., recovered fully the resource costs (incurred by the seller). Viewed another way, if the buyer did *not* express a need for the service (and back it up with a price offer), the seller would *not* commit productive resources to its supply and would, therefore, *avoid* expending valuable

[3] In much the same way that a television set is the delivery vehicle by which advertisers bring messages into the home and that a DVD player is the delivery vehicle by which consumers use the DVDs they purchase or rent.

productive resources. Clearly, the only price the seller would find acceptable would be one that would make it worthwhile to use resources in order to provide the service. Hence, the price resulting from a successful transaction here would necessarily be *caused* by the cost to provide the service. This principle of cost causation is *the* fundamental precept of pricing:

1. A price must reflect a cost and, in particular, the (demand) activity or decision that gives rise to it.

2. For setting the price, it does not matter what subsequent use the service may be put to or, if its use is shared, what distribution of benefits it may create past the original point of sale.

Only this cost causation basis for pricing can generate prices that are economically efficient and result in buying and selling transactions that maximize social welfare. Hence, given the obvious normative appeal of that pricing principle, it follows that the underlying measure of cost should be the cost that is caused by a given activity. The only such measure of cost is incremental cost, which is, by definition, prospective and forward-looking.[4]

Q. Doesn't the view that the local loop is a shared facility imply that its costs are not incremental to any specific service but, rather, are shared by all services delivered over the loop? Also, is this view correct and, if not, what could be the consequences of holding such a view?

A. The local loop is most assuredly *not* a shared facility, and it is *not* the source of shared fixed costs to a LEC like Verizon MA. Instead, its cost is incremental to basic residential service (as the cost of the portion of that service that provides network connectivity to the customer). I examine this issue at length below because whether the cost of the loop is treated as incremental or shared makes a big difference. According to the principles of cost causation and efficient pricing, if the cost is incremental, it must be recovered in its entirety

[4] The issue here is only whether pricing should *start* with incremental cost. That does not mean that an economically efficient price should always be *equal* to its corresponding incremental cost. Rather, it must at least recover forward-looking *economic* cost (i.e., the sum of incremental cost and an appropriate market-determined contribution to shared and common costs). The economic cost price level is obviously higher than the incremental cost price level, and the difference is only relevant for multi-service firms that experience economies of scale and/or scope.

from the source that caused that cost, e.g., basic residential service. On the other hand, if the cost is shared, then it may be recovered in a distributed manner from the different services that supposedly share the local loop.

Dr. Gabel holds the view that the local loop is a shared facility because it is the means for delivering not just basic residential service but also long distance (toll) service, vertical services, and other services. He presses for allocating the cost of the loop to all of its different *uses*, and challenges any effort to assign all of that cost to basic residential service of which the loop is an integral part. That view is mistaken.

Q. Why do you disagree that allocating the cost of the loop is valid?

A. Economists generally disagree with this view of the local loop as a shared facility because it conflicts with the fundamental principle of cost causation.[5] That principle tells us why the resources used in providing the loop have been expended. The answer is simple: the costs associated with the loop are caused by *a customer gaining connectivity to the network*. That is true whether that connectivity is gained as part of a standard bundled offering like basic residential service (which bundles the loop and local usage) or, in the new environment, by purchasing an unbundled loop. Once the loop is provisioned, the cost is incurred. The way in which it is *used* (if at all) *does not change that cost*.

This is a subtle, but important, point. A customer that purchases (or leases) the loop essentially acquires the *right* to access the network and receive services of his or her choosing. Actual usage of the loop does not matter for cost causation. The loop has been provisioned—and a cost incurred—regardless of whether the customer uses the loop at all, uses only one service, or uses multiple services. The cost of that loop should be

[5] See, e.g., Rebuttal Testimony of John W. Mayo (on behalf of AT&T), *In re: Investigation into NTS Cost Recovery, Phase I*, Florida Public Service Commission Docket No. 860984-TP, June 1, 1987; John T. Wenders, *The Economics of Telecommunications: Theory and Policy*, Cambridge, MA: Ballinger, 1987; Alfred E. Kahn, "Pricing of Telecommunications Services: A Comment," *Review of Industrial Organization*, 8, 1993, at 39-41; William E. Taylor, "Efficient Pricing of Telecommunications Services: The State of the Debate," *Review of Industrial Organization*, 8, 1993, at 21-37; and Lester D. Taylor, "Pricing of Telecommunications Services: Comment on Gabel and Kennet," *Review of Industrial Organization*, 8, 1993, at 15-19.

recoverable regardless of actual use. The contrary position—that the loop's cost should depend on *how* it is used—is based on a fallacy.

To see why that is so, it is reasonable to ask whether the cost of the loop should be recovered differently from different customers, depending on how many services (including none at all) they use. If the answer is "yes," then the fallacy just gets deeper and leads to absurd results. For example,

- shouldn't the cost of constructing a highway then be considered a shared or joint cost to butchered meats, milk, stereo equipment, and dry cleaning if distributors of these products use that highway to receive them?

- shouldn't a car be considered a shared cost of motels since access to motels is facilitated by the car?[6]

The fallacy of equating shared cost with shared use can be eliminated by thinking of the loop facility as a provider of connectivity to the network—a service in its own right and, therefore, a facility with its own unique cost and price. This requires that the loop be thought of as an "output" rather than as an "input."[7] Dr. Gabel apparently agrees [at 9, footnote 17] with the premise that a service must be demanded in its own right.[8]

It is instructive to further explore the idea that connectivity to the network (the loop) is a service in its own right, an idea with which Dr. Gabel evidently disagrees. A customer may take just the dial tone service (in order to *receive* calls) but avoid originating toll or other types of calls over the telephone network. That is, while dial tone service logically precedes consumption of any other service, taking the connectivity service does not *require*

[6] Steve G. Parsons, "Seven Years After Kahn and Shew: Lingering Myths on Costs and Pricing Telephone Service," *Yale Journal on Regulation*, 11, 1994, at 159, note 35.

[7] Professor John Mayo, testifying on behalf of AT&T, has endorsed this view of the loop. For example, in a 1996 case, he disagreed with the notion of recouping the loop cost through an allocation mechanism, stating instead: "It is well known in the economic analysis of the telecommunications industry that there is a well-defined demand for, and supply of, access to the telecommunications network. The costs of providing that access can, and should be borne by the consumers that cause these costs to be incurred." Rebuttal Testimony of John W. Mayo, on behalf of AT&T, Maryland Public Service Commission Case No. 8715, March 14, 1996, at 9. Also see the references in fn. 10, *supra*.

[8] Dr. Gabel cites Alfred E. Kahn and William B. Shew, "Current Issues in Telecommunications: Pricing," *Yale Journal on Regulation*, 4, 1987, at 200-201 on this point ("Kahn and Shew").

that some other service also be taken. Customers do not purchase dial tone and other services in fixed proportions (e.g., one dial tone line with 100 minutes of toll and twenty uses of Call Forwarding); hence, the cost among them cannot be joint. Once a customer acquires network connectivity or a loop, other services can only be made available to that customer at *additional* cost. For example, provision of toll service to a customer would cause the network to incur a cost that is separate from that for the loop. Therefore, the loop or dial tone service cannot be a joint or shared cost.

Economists offer several other arguments against regarding the loop as a shared or common cost. Some of these are as follows.[9]

?? Charges for connectivity alone are common in many competitive markets (e.g., clubs, credit cards, on-line computer services, long distance telephone service, etc.).

?? The cost of a service should not be confused with the *benefits* that service provides. Loop costs belong to network connectivity by the customer regardless of whether the loop provides value to other services or customers.

?? Loop costs cannot be considered shared between local and other services (e.g., Internet and optional services) because those services may be provided by different firms. A cost cannot be shared by (and be recovered jointly from) independent companies. Rather, costs are specific to firms or decision-makers.

?? Any service offering should be priced to cover at least the incremental cost of supplying the offering. Hence, any bundled offering which includes a loop should be priced to cover at least the full incremental cost of the loop and the remaining elements of the bundle.

Q. How do you respond to Dr. Gabel's citation [at 9, footnote 17] of economist Jerry Hausman's statement that "nobody would buy a local loop just because it's a local loop?"

A. Dr. Hausman's statement is obviously true for the vast majority of telephone customers. The only exception to this is when a customer requests network connectivity (provided by the local loop) simply for the purpose of being able to receive calls. This is not as far-fetched as it may sound. Although the practice may be rare, there are instances where customers request the capability only to receive calls. For example, cellular mobile service

[9] See, e.g., Kahn and Shew, *op cit.*, at 191-256, and Parsons, *op cit.*

providers sometimes offer that capability at much lower monthly prices than are charged for two-way communications. Moreover, Dr. Hausman's statement does *not* imply (as Dr. Gabel apparently takes it to mean) that the cost of the local loop shouldn't be determined by applying the cost causation principle, *even when* customers use the local loop to receive various usage services.

Moreover, even if no one would buy a loop without also buying some other service that uses the loop, it would still be efficient to charge at least the full cost of the loop for any bundle that includes the loop. No one buys a DVD player without at least expecting to buy or rent DVDs; nonetheless the price of any package of DVD players and DVDs—including a standalone DVD player—will exceed the incremental cost of the components of the package.

Q. Is it economically efficient to charge for the local loop as a separate network service, even though Dr. Gabel asserts [at 13] that the incremental cost of such connectivity "is, or nearly is, zero?"

A. Yes. Under current practice, that is exactly how it is priced (with dial tone and usage bundled together to form the core basic residential service). The cost causation principle guides economically efficient pricing of the loop. Consider the following passage from the paper by economists Alfred Kahn and William Shew [see footnote 8 above].

> ... First, does subscriber access have a separate identifiable incremental cost associated causally with providing it? The answer is, unquestionably, yes. Connecting a customer to the network uses scarce resources, even if he or she never uses the connection. The customer who subscribes to two access lines imposes a greater cost than a customer who subscribes to one, even if they make the same number of calls, at the same times and places.
>
> Second, does charging for access separately serve a purpose? The answer is that it serves the very important purpose of economic efficiency if buyers are confronted, in each of their purchase decisions, with prices that reflect the respective incremental costs to society of their taking more or less of each available good and service or, to put it another way, what costs society would save if they took less of each.
>
> …

> Using the price of telephone calls to recover access costs that do not in fact vary as more or fewer calls are made therefore induces wasteful choices by customers. It encourages them to order underpriced access lines that they value less than the incremental costs to society of providing the lines, and it discourages them from making overpriced calls whose value to them would have exceeded the incremental cost to society. The same result would follow if an electric utility were to supply its customers with all the appliances they wanted at no charge and recovered the costs in the price of electricity—wasteful overpurchasing of appliances and underconsumption of electricity.[10]

Only a price reflecting the full economic cost of the loop ensures the socially optimal level of use of that facility. If the loop is part of a bundled basic residential service, then the full economic cost of the loop should be a part of the cost of that bundled service. The error in Dr. Gabel's analysis of this issue arises in the artificial distinction he draws [at 13] between the local loop and the dial tone service. Properly viewed, they are the one and same from the standpoint of how the LEC provisions them or how they cause cost for the LEC.

Q. Please provide a sense of the practical problems that can arise from treating the loop as a source of shared cost.

A. Consider the case of two customers, say, Fred and Barney. Fred makes only local calls while Barney makes use of all available services. If Fred had a line installed for the sole purpose of making local calls, then the loop cost ought to figure entirely in the cost of his local service. On the other hand, following the logic of the loop-is-a-shared-cost view, Barney's loop cost would have to be distributed across the various services he uses. Assuming that all customers are located somewhere on the spectrum between Fred's usage and Barney's usage, loop costs would have to be recovered differently from each customer as long as they all have different usage mixes. That is nothing short of an accounting and regulatory nightmare! Moreover, if such a practice were defended by an appeal to "cost causation" then clearly the manner in which loop cost is caused would appear to be different for each customer. Even resorting to some fictional "average" mix of usage for distributing loop cost would be arbitrary, meaningless, and economically inefficient. That

[10] Kahn and Shew, *op cit*., at 201-202 (footnotes omitted).

is because for Fred (who only makes local calls), the price of local service—based on this average usage procedure—would be lower than what it ought to be, thus encouraging over-consumption of local service. In contrast, for Barney (who uses every service), the price of any given service would be "too high" if his usage of that service were below the average usage, or "too low" if his usage of that service were above the average usage. In either case, consumption of services would be artificially distorted and resources would be allocated inefficiently.

In contrast to this highly garbled scenario, the assignment of loop costs uniquely to basic residential service, that is the connectivity enabled by the dial tone line, creates none of the confusion. Whether the customer is Fred or Barney or someone in between, they all pay the same price for access and pay prices for other services that are based purely on their respective incremental costs.

Q. What practical problems could arise from allocating—as Dr. Gabel suggests it should be—the cost of the loop to various services that may be provided over it?

A. Opting to allocate the cost of the loop to different services that can be provided over it quickly gets us down the slippery slope of having to (1) estimate the share that each service should carry, (2) use arbitrary allocators that have no economic justification (e.g., should a non-usage-sensitive cost be recovered through usage-sensitive charges?), and (3) spread recovery across not merely different services but across different *service providers* as well. None of these actions have any economic validity.

First, consider what would happen if each service that *could be* carried over the loop were to be assigned its share of the cost to recover. As with the Fred and Barney example, variations in usage patterns among customers would inevitably compel us to work with broad averages instead. This would require us to estimate average usage *levels* of all services and, hence, the corresponding average usage *shares*. In practical terms, because usage services are measured in different physical units (e.g., minutes and calls), any average would have to be measured in dollars and cents. However, even that may not be quite so simple because several usage services are purchased on flat-rated plans that remove the ability to measure actual usage (e.g., fixed monthly charges unrelated to actual usage for

local usage, certain vertical services, or Internet service). Assuming that average revenue shares for all services can somehow be determined, the next step would be to assess additional charges on those services in the same proportions as the average usage shares, even though those services do not, in and of themselves, generate loop costs. After all this, however, three problems would still remain.

1. Those charges would have to be adjusted periodically (every month? year?) as the average usage shares themselves changed.

2. Changing relative prices of the services could change the average *revenue* shares themselves even without any change in the underlying average usage measured in physical units. Therefore, some kind of complicated index would have to be used instead.

3. Customers with usage patterns different from the average would end up either subsidizing other customers or being subsidized. This would, in turn, be accompanied by distortions in the economically efficient levels of consumption of the services.

Second, the use of arbitrary allocators would mark a return to the discredited – and economically indefensible – practice of using fully distributed costs to set prices. Basic questions like "should non-usage-sensitive loop or facility costs be recovered through usage-based charges?" would re-surface. At the interstate level, the FCC has already moved to replace some past pricing anomalies (like minutes-based carrier common line charges for carrier access) with more appropriate fixed line charges. There are several theoretical and practical reasons for not resorting to arbitrary minutes-based allocators of the loop cost. In addition, there is little economic justification for any allocation mechanism that recovers the *same* proportion of shared and common costs from a set of designated services. Such an allocation is no more or less arbitrary than one which relies on minutes of use; in fact, any allocation not based on cost causation is arbitrary and, therefore, without any economic basis.

Third, the allocation approach quickly gets us into other untenable scenarios such as, for example, burden sharing among different service providers (LECs, long distance carriers, and other competitors). Apart from the fact that such an arrangement could not be enforced without the use of substantially *more* regulatory (and possibly legislative) might, it is also an infeasible and unrealistic prospect under market competition where service providers of

different stripes have no economic incentive whatsoever to cooperate (on burden sharing or anything else).

Q. What has the FCC specifically prescribed regarding the recovery of costs?

A. A key issue for the FCC has been the treatment of non-traffic-sensitive ("NTS") costs. Through its rulings, the FCC has repeatedly shown that it clearly understands that economic efficiency is reduced if NTS costs are recovered using traffic-sensitive ("TS") prices. With respect to the portion of the loop cost allocated to the interstate jurisdiction, the FCC has moved away from usage-based recovery:

> Because common line and other NTS costs do not increase with each additional minute of use transmitted over the loop, the current per-minute CCL charge that recovers [interstate] loop costs represents an economically inefficient cost-recovery mechanism and implicit subsidy. A rate structure that recovers NTS costs through per-minute charges creates an incentive for customers to underutilize the loop by requiring them to pay usage rates that significantly exceed the incremental cost of using the loop. Additionally, a rate structure that forces high-volume customers to pay significantly more than the cost of the facilities used to service them is not sustainable in a competitive environment because high-volume customers can migrate to a competitive LEC able to offer an efficient combination of flat and per-minute charges, even if the competitive LEC has the same or higher costs than the incumbent LEC.[11]

With respect to the recovery of the cost of unbundled network elements ("UNEs"), the FCC again has clearly expressed its requirement that costs of dedicated (activity-specific) facilities "including, but not limited to, charges for unbundled loops, dedicated transport, interconnection and collocation" be recovered on something other than a usage basis. The FCC now requires

> flat-rated charges for dedicated facilities. Usage-based charges for dedicated facilities would give purchasers of access to network elements an uneconomic incentive to reduce their traffic volumes. Moreover, purchases of access to network elements with low volumes of traffic would pay below-

[11] FCC, *In the Matter of Access Charge Reform*, CC Docket No. 96-262, First Report and Order, May 16, 1997, ¶69.

> cost prices, and therefore have an incentive to add lines that they would not add if they had to pay the full cost.[12]

Finally, in its *CALLS Order*, the FCC cited affirmation by the Eighth Circuit of Appeals of its view that the cost of the local loop is caused by a customer gaining connectivity to the network.

> In doing so, the court reaffirmed the Commission's long standing view that the subscriber "causes" local loop costs, whether the subscriber uses the service for intrastate or interstate calls. These costs are, in any event, recovered from the end user, either through direct end-user charges or indirectly through higher rates or additional charges paid to IXCs. The court further affirmed the Commission's conclusion that it was appropriate and rational for the Commission to impose these costs on the end user.[13]

Q. Dr. Gabel claims [at 9] that the FCC has itself recognized that the local loop is a source of common cost. How does this square with your discussion above?

A. Regardless of what it said in one paragraph of a rather lengthy document (namely, the *Local Competition Order*), the actions the FCC has taken to devise a flat-rated subscriber line charge for the recovery of a designated NTS facility like the local loop speak loudly and clearly. Again, it matters not that the local loop can be used in several different and simultaneous ways; for cost recovery, it only matters how the cost is caused and how it is recovered. For this reason, the FCC's move to recover the cost of dedicated facilities that are NTS in nature through separate flat-rated charges assessed directly on end-user customers removes any doubt about its reliance on cost causation for local loop cost recovery. Being customer-specific, local loops are clearly dedicated facilities; in addition, they are NTS facilities because they are invariant to the volume of usage services received over them.

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[12] FCC, *In the Matter of Implementation of the Local Competition Provisions in the Telecommunications Act of 1996*, CC Docket No. 96-98, First Report and Order ("*Local Competition Order*"), August 8, 1996, ¶744.

[13] FCC, *In the Matter of Access Charge Reform, Price Cap Performance Review for Local Exchange Carriers, Low-Volume Long-Distance Users, and Federal-State Joint Board on Universal Service*, CC Docket Nos. 96-262, 94-1, 99-249, and 96-45, Sixth Report and Order in CC Docket Nos. 96-262 and 94-1, Report and Order in CC Docket No. 99-249, and Eleventh Report and Order in CC Docket No. 96-45 (*"CALLS Order"*), May 31, 2000, ¶95.

Q. Do you agree with Dr. Gabel [at 10] that the manner in which the FCC conducts its price squeeze examination in Section 271 proceedings establishes that the cost of the local loop is shared?

A. No. The FCC's price squeeze examinations in such proceedings concern basic residential service as a whole, i.e., inclusive of vertical and other services. Obviously, when the "service" being examined is defined at that aggregate level, it would be necessary to compare revenues and costs associated with all of the components of that service. The question here, on the other hand, is one of the appropriate recovery of the cost of the local loop (or network connectivity service) which is just one of the components of the more aggregated basic residential service. The cost causation principle dictates that the entire cost of the loop be charged to the customer requesting it and, in practice, it often is. In a similar vein, the entire cost of basic residential service (including the cost of the loop) must be recovered from the customer purchasing it. The fact that the cost of the local loop is customer-specific is in no way inconsistent with the FCC's price squeeze examination with respect to the aggregated basic residential service.

Q. Have state regulators addressed the issue of recovering loop costs from services that use the loop?

A. Yes, but state regulators have historically been required to make decisions that balance a variety of concerns and, until recently, economic efficiency was not the most important consideration. Before the Telecommunications Act of 1996 and the elimination of entry barriers that opened telecommunications markets to competition, one primary objective of state regulatory decisions was to keep the price of basic residential service sufficiently low so as to meet universal service objectives. An informal regulatory compact—among state and federal regulators and local exchange carriers—led to a partial shifting of the responsibility for local loop cost recovery away from basic residential service to long distance, carrier access, and basic business services. The shifting of that responsibility was only a policy measure intended to subsidize basic residential service, *not* a validation of the premise that the local loop constitutes a shared cost.

Q. Dr. Gabel argues [at 11] that recent advances in network technology call into question whether local loops should be considered NTS facilities anymore. Do you agree?

A. No. It is true that fiber in the feeder loop and loop electronics imply a fundamentally different loop network configuration than when both the distribution and the feeder loop are made up of copper wires. As Dr. Gabel states correctly, in an all copper loop network, the loop cost remains customer-specific, dedicated, and NTS over the entire connection between the customer premises and the central office. In contrast, the presence of loop electronics and digital loop carriers in the feeder portion of the loop network does introduce the potential for TS cost (to the extent that those facilities are shared by customers according to the concentration ratios cited by Dr. Gabel). This does not mean, however, that the NTS portions of the loop network (primarily in the distribution loop up to the remote terminal where multiplexers are housed) disappear as a result. This only means that, for purposes of cost recovery, the cost of the loop then comprises a mixture of NTS (or dedicated) and TS (or shared) costs.

Q. How do you respond to the example (involving telecommunications links for two towns named "Faraway" and "Evenfarther") that Dr. Gabel provides [at 12] to make the point that incremental cost of the local loop is zero or close to it?

A. Dr. Gabel's analogy between the two towns linked serially by a common trunk line and a customer's use of the same loop to receive different usage services is forced and insufficient to reach the conclusion about the incremental cost of the loop being zero. I agree with Dr. Gabel that a common trunk line connecting the telecommunications network serially to both Faraway and Evenfarther would be a shared cost to both towns. But, that is *not* the arrangement that arises when the customer uses the same local loop to receive different usage services. The proper analogy here would be of a local loop that serially connects two *customers* to the network. In that instance, the loop would not be dedicated to either customer and would, therefore, not be an incremental cost to either. The use of a local loop by a single customer to receive various usage services does not fall into this mold. The network connectivity provided by that loop remains dedicated and specific to

that customer. Therefore, the cost of the loop remains incremental to the customer and should be included in the incremental cost of the overall basic residential service.

Q. Noting that modern technology makes it possible to use the local loop for joint delivery of both voice and non-voice services, Dr. Gabel suggests [at 28] that the cost of the loop is essentially shared. Do you agree?

A. No. The cost of the loop arises at the point the customer requests the loop, regardless of whether he or she uses it solely to receive voice services (in the low-frequency range) or to receive data services (in the high-frequency range), or both. The important point is that services provided over the two frequency ranges are joint products (i.e., available in fixed proportions). If the customer purchases the loop solely to receive voice services, then the high-frequency range is available at zero incremental cost. Similarly, if the customer purchases the loop solely to receive data services, then the low-frequency range is available at zero incremental cost. Thus, *the cost of the loop is caused only once, at the point of its purchase by the customer (and supply by the LEC).* This fact remains true regardless of whether the customer uses both frequency ranges, or whether she uses the LEC to receive services on one portion of the loop and a competing service provider to receive services on the other portion of the loop. The joint *use* does not change the fundamental fact that the entire cost of the loop must be recovered from *that particular* cost-causing customer, not from other sources. *How* a cost arises should be distinguished from how it is *recovered*; how it arises only establishes *from whom* it should be recovered.

Q. Is the case of line sharing different from the case of connectivity and usage?

A. The difference is that access to the low and high frequency components of the loop is a joint product, like the yolk and white of an egg, while connectivity and usage are not joint products. Access to low and high frequencies are produced in fixed proportions, and the incremental cost of one or both of the services is the same: similarly, the incremental cost of an egg, an egg white and an egg yolk are exactly the same. Dial tone and usage are *not* produced in fixed proportions, and the incremental costs of dial tone bundled with different amounts of usage are all different.

Q. Please summarize your objections to Dr. Gabel's characterization of the local loop as a shared facility and a source of shared cost that should be recovered in prices of all the services that can be delivered over the loop.

A. Specifically, my objections to that characterization are as follows:

1. It ignores or misuses the benchmark economic principle of cost causation. As a result, it confuses the cost-causer (namely, the consumer or purchaser of the loop) with the entity that incurs, and needs to recover, the cost (namely, the supplier of the loop). It stands cost causation on its head by focusing on the possible *uses* of the loop—whether intended or not by its purchaser—as opposed to the economic activity that gave rise to its cost. The cost of the loop arises as it is first provisioned; how it is used subsequently does not change that cost.

2. It fails to distinguish between network connectivity (provided by the loop) and usage services that are typically bundled into basic residential service. Hence, it fails to recognize that network connectivity is an output, not an input, and may be demanded independently in its own right.

3. Charging for network connectivity separately from usage services is economically efficient. It also avoids having to engage in nightmarish calculations of the share of the loop's cost that must be borne by other services, particularly when (1) consumers may consume usage services in different proportions and those proportions may change over time, and (2) the services are provided by different service providers, all using the same loop as a delivery vehicle. Any method of allocating the loop cost is likely to be arbitrary and fraught with uncertainty.

4. A facility is shared only if the answer is "no" to the question: Does the entire cost of the allegedly shared facility disappear when one of the services it is claimed to support is withdrawn? As its cost disappears only with the withdrawal of basic residential service, the local loop cannot be a shared facility.

V. DIAL TONE LINE SERVICE REMAINS THE MOST INELASTIC SERVICE PROVIDED BY VERIZON

Q. Dr. Gabel asserts [at 13-14] that it makes no sense to increase the dial tone line charge because it is not clear that dial tone line service is the more inelastic service relative to other services provided by Verizon. Do you agree?

A. No. Everything I know about the telecommunications markets in Massachusetts leads me to conclude that an increase in Verizon MA's dial tone line rate would be efficient. Dr. Gabel's position is apparently premised on the assumption that the current competitive

environment has significantly changed the measure of relative elasticities for residential basic service compared with, for example, the usage and vertical services offered by Verizon. This is unlikely to be the case. Most informed industry observers would agree that residential basic service has always been the least elastic service offered by a telephone company. Even Dr. Gabel [at 14] agrees this is true.

Dr. Gabel and I differ, however, on the effect that recent competitive entry has had on relative firm level elasticity values. Dr. Gabel observes that recent competitive entry now provides a variety of substitutes for Verizon's dial tone line service and notes that the availability of substitutes is likely to increase Verizon's firm level dial tone line service elasticity. In theory, an increase in the availability of substitutes will have this effect. However, while Dr. Gabel's observation regarding the emergence of competitive alternatives as substitutes for Verizon's dial tone line service is accurate, he fails to consider that many of those same alternative services (i.e., wireless and cable telephony) also provide substitute alternatives for usage and other services provided by Verizon. Thus, the same competitive activity he cites as likely to raise the dial tone line price elasticity will also undoubtedly raise the price elasticity for the other services Verizon MA provides. Indeed, insofar as competitive alternatives for toll services emerged long before they did for dial tone service, it is likely that any movement towards a more elastic level would be greater for toll than dial tone service.

Q. Dr. Gabel asserts that, unless Verizon can "verify" that its dial tone line service elasticity is less than the elasticity for other services it offers, "it is irresponsible" to act in accordance with a belief this is true. Do you agree?

A. No. Dr. Gabel's belief [at 14] that "price increases cannot be characterized as Ramsey efficient" unless we "know the price elasticities" is unreasonable and, if embraced by the Department, would serve to forestall all price changes virtually forever. Indeed, Dr. Gabel softens his position [at 20] when he agrees "that it is unrealistic to expect a regulator to develop a full-blown set of Ramsey prices." In my opinion it unambiguously would be unreasonable and unnecessary for the Department to require Verizon to develop such measures.

It would be unreasonable because accurate measure of such elasticities requires knowledge of how demand for Verizon MA's services would change as its prices change and as the prices of Verizon MA's competitors' services change in response. These parameters, in turn, depend on market conditions (e.g., the degree to which other services supplied by Verizon MA and by competitors are substitutes or complements for the Verizon MA services in question). Contrary to Dr. Gabel's opinion [at 20], it is unlikely that econometric estimates of these parameters from other times and other geographic areas would be relevant. In particular, the market demand elasticities discussed in the econometric literature were measured from data that did not include competitors' offerings and other substitute services prevalent today (and described in Dr. Gabel's testimony). Furthermore, firm or market demand elasticity measures developed using specific characteristics of price and competitive alternatives from some other state are not likely to mirror those pertinent to services provided in Massachusetts and thus, contrary to Dr. Gabel's opinion again, would be of little use.

It is unnecessary to require that such measures be made because the market is the best mechanism to signal if a price change exceeds the appropriate level. Allowing, but *not requiring*, that basic service rates can be increased by 5 percent per year provides Verizon the means to test the market. If an inappropriate price change is imposed, the market will respond by reducing Verizon's profits. It is not necessary to know the level of the service price elasticity because its effect on demand will occur regardless. Furthermore, market prices set this way will move in the direction of Ramsey prices insofar as the price of more inelastic services will recover relatively more contribution to the firm's fixed costs than will the price of a more elastic service.

VI. EMBEDDED COST ANALYSIS HAS NO RELEVANCE TO ISSUES IN THIS PROCEEDING

Q. Dr. Gabel asserts [at 14] that the result of his embedded cost analysis reveals that the current cost of basic residential service is below the current rate and thus "the proposed rate increase is not just and reasonable." Do you agree?

A. No. Dr. Gabel's embedded cost analysis has no relevance whatsoever to the issues in this proceeding. In particular, such cost measures have no relevance to the concept of 'just and reasonable' as it pertains to the price of telephone services provided under regulatory and current market conditions in Massachusetts. Embedded cost analysis is by definition a historical cost analysis and as such should not be confused with forward-looking costs and/or economic efficiency. As the Department has already affirmed:

> we can look to principles of competitive pricing for standards to judge whether regulated prices for specific services are just and reasonable. In competitive markets for telephone services, efficient market prices are based on incremental cost plus a mark-up for joint and common costs, based on Ramsey pricing principles.[14]

There is no merit in Dr. Gabel's claims regarding the application of his embedded cost analysis to Verizon MA's proposed rates.

A. Verizon's Proposal Is Not In Conflict With Section 254(k) of the Act

Q. Dr. Gabel asserts [at 14] and discusses in Section 8 of his testimony his belief that "approval of the rate increase will negate this Commission's (sic) responsibilities regarding the prohibition of subsidies to competitive services" under Section 254(k) of the Act. Please comment.

A. There is no merit to Dr. Gabel's claim regarding any failure on the part of the Department to conform to Section 254(k) of the Act. There is no basis *whatsoever* for a concern about a subsidy of "competitive services by services included in the definition of universal service under Section 254(k)." Gabel reveals [at 32] that the basis of this claim is his belief that the loop is a joint and common facility and that currently, "100% of the joint and common costs are recovered from the residential service." Insofar as Dr. Gabel's assertion that the loop is a joint and common facility is without foundation, an issue I have discussed at some length earlier, there is no foundation for his subsequent claim regarding Section 254(k).

[14] Investigation by the Department of Telecommunications and Energy on its own Motion into the Appropriate Regulatory Plan to succeed Price Cap Regulation for Verizon New England, Inc. d/b/a Verizon Massachusetts' (continued...)

Furthermore, a claim that competitive services are in receipt of a subsidy would require a demonstration that the price for these services does not recover the direct costs to provide them. A service is subsidized only if its price is less than the forward-looking direct costs incurred to provide the service. Forward-looking total direct costs are measured by a total service long run incremental cost (TSLRIC). Dr. Gabel makes no such showing, indeed a review of the Contribution Analysis in Ms. Brown's testimony suggests that such a showing could not be made. Indeed, the Contribution Analysis clearly implies for Massachusetts what most economists believe for telecommunications in general: that if there is any flow of subsidy across services, it would be in the opposite direction from Dr. Gabel's concern.

VII. VERIZON'S PRICING PROPOSALS *ARE* CONSISTENT WITH ECONOMIC EFFICIENCY

Q. Dr. Gabel disputes [at 16] the Department's belief that any price within the range of incremental cost and stand-alone cost could prevail in an efficient, competitive market. How do you respond?

A. This debate is semantic, not economic. Dr. Gabel himself agrees [at 16, lines 24-25] that "these prices can be expected to lie between incremental and stand alone costs …" but then goes on to argue that not all prices within that range would be possible in a competitive market. While it is possible that any price between incremental and stand-alone cost *might* be Ramsey-efficient, it is certainly not the case that *every* price in that range is necessarily Ramsey-efficient. The Department's statement should only be taken to mean that an efficient price in a competitive market is expected to lie somewhere within this range.

Q. Given Dr. Gabel's discussion of this issue, what price *should* be considered efficient?

A. Prices in competitive markets possess two essential properties. First, they tend to be *subsidy-free*, i.e., they neither receive nor provide a subsidy and cannot be considered predatory. Second, prices in competitive markets tend to be *efficient* by being driven by

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(...continued)

intrastate retail telecommunications services in the Commonwealth of Massachusetts, D.T.E. 01-31-Phase I, May 8, 2002, p. 101.

market conditions to being as close to underlying incremental costs as possible. This notion of efficiency (also known as *allocative* efficiency) is considered "first-best" when prices are exactly equal to incremental costs because then what the seller seeks to recover in its price is exactly the value of the resources expended to serve a given increment of demand. As is commonplace in telecommunications, however, the presence of large shared and common costs implies that if the firm priced all of its services exactly at their respective incremental costs, then it would never recover the shared and common costs, i.e., it would not break even or remain viable in the long run. Hence, in the presence of shared and common fixed costs, first-best efficiency must yield even in nominally competitive markets to "second-best" efficiency which allows service prices to be marked up above their respective price floors in order to provide contribution toward the full recovery of shared and common costs. Any such departure from the price floor entails some loss of allocative efficiency, so the trick in attaining second-best efficient prices is to ensure that the allocative efficiency losses are minimized. In competitive markets with distortions, the relative strength of demand for the different services (manifest in their respective price elasticities of demand) plays a major role in determining how much each price should be marked up in order to minimize the loss of allocative efficiency.

As a practical matter, the appropriate burden to place on Verizon MA's service prices is that they each equal or exceed their corresponding incremental cost price floors. Economists recognize that stand-alone cost is a useful concept in theory, but extremely difficult—perhaps even impossible—to implement in practice. That is because telecommunications companies, especially LECs like Verizon MA, produce a wide range of services from networks that rely to a substantial degree on shared and common assets. This makes the calculation of the stand-alone cost of any single service entirely a matter of conjecture, an exercise complicated by the fact that LECs do not typically build networks to produce one service at a time. The larger the shared and common costs in a LEC network, the more complicated it gets to imagine the network that would be built to provide the single service and to estimate its stand-alone cost. For example, what does a stand-alone network constructed to supply call-forwarding services look like?

Q. Please comment on Dr. Gabel's apparent conclusion [at 18] that even prices that satisfy the subsidy-free criteria (i.e., are in the range between incremental and stand-alone costs) cannot be trusted to be just and reasonable for all customers.

A. As explained earlier, Dr. Gabel appears to straddle two worlds: the regulatory world that oversees the operations of a public utility with natural monopoly characteristics and a competitive world in which proven competitors have already emerged. Verizon MA's new pricing directions are rooted in the latter world, reflecting the successful market-opening developments in Massachusetts. It would be improper and unwise to continue applying standards appropriate to the regulated public utility world to judge what emerges as just and reasonable in a market subject to competitive forces. I agree with Dr. Gabel that Verizon MA's prices should not be anti-competitive; for that, I can understand continuing to apply price floor tests to those prices. However, attention must now shift to efficient prices that are market-determined, rather than prices deemed to be efficient (or just and reasonable) by appealing to an abstract regulatory standard based on arbitrary allocations of accounting costs. Indeed, even the old break-even constraint for natural monopoly public utilities is no longer viable, as Verizon MA has been subject to incentive regulation since 1995. The real virtue of competition is that efficient or just and reasonable prices do not have to be picked arbitrarily from the wide array of possibilities represented by the range between incremental and stand-alone costs; rather, the collective actions of consumers (especially those differently situated) and competing suppliers determine what those prices ought to be. The presence of viable competitors acts as a policing mechanism that keeps the incumbent's prices in check.

Q. Do you agree with Dr. Gabel's assertion [at 18] that "the allocation of all shared costs to dial tone (or the dial tone and local call bundle)" cannot be efficient?

A. No, for the simple reason that asking the local loop's price to recover the entire amount of its incremental cost does *not* amount to "allocating all shared costs" to the network connectivity (i.e., dial tone) service. As explained earlier, the cost of the local loop is not shared; hence, the inclusion of all of its cost in the dial tone or basic residential service does not represent a 100 percent allocation of "shared" costs to any of those services. As

discussed earlier the same fallacy in Dr. Gabel's reasoning emerges in his discussion [at 32] of whether Verizon MA has complied with the definition of universal service under Section 254(k) of the Telecommunications Act of 1996.

Furthermore, Dr. Gabel's attempt to cast the supposed allocation of "shared loop costs" in terms of the own-price elasticity of demand for dial tone and other services is an irrelevant exercise. While Ramsey-like pricing principles rely on price elasticities to recover shared and common costs from different services, the fact that the cost of the local loop is not shared makes this entire discussion moot.

Q. As a general matter, do you share Dr. Gabel's views [expressed mainly at 19-22] on the utility and practicality of the Ramsey pricing principle for pricing Verizon MA's services?

A. As a general matter, I do. However, I would add another dimension to this discussion of pricing in the presence of substantial shared and common costs in competitive markets. I agree with Dr. Gabel's discussion of the "Ramsey insights" that regulators could benefit from in overseeing Verizon MA's prices in a competitive market. I also agree that precise knowledge of individual own-price and cross-price elasticities for all of Verizon MA's services is not necessary for ensuring that prices move in directions generally warranted by the Ramsey pricing principle. Assuming that those elasticities are known and available—a dubious assumption in the best of circumstances—implementation of that pricing principle is much easier when the old regulatory break-even constraint is in place. That is because, with that constraint in effect, the firm's revenue requirements are precisely known, and markups in service prices can be carefully calibrated according to the known price elasticities.

However, when that constraint does not apply (as in the current environment) and, more importantly, price elasticities are not known precisely, then Ramsey-like results can be approximated by allowing the market (and customers, in particular) to reveal the sustainable level of markup in each service price. This can be accomplished by allowing multiple competitive choices that offer customers several alternative combinations of price, volume, and service quality. As customers select their most preferred options in a competitive market, they reveal, in effect, the relative strength of demand for each service.

The sustainable prices that emerge as a result then simulate the outcomes from a pure Ramsey pricing exercise. Thus, regulators can hope to achieve Ramsey-like efficient prices by letting the market take on much of the load in this fashion. Granting marketing and pricing flexibility to Verizon MA would be an important step in this direction.

VIII. VERIZON'S CHARGES TO DEPENDENT COMPETITORS ARE NOT INEFFICIENT AND WILL NOT HARM COMPETITION

Q. Please comment on Dr. Mayo's prescription [at 17] for the retail price floor for a Verizon MA service that employs a "monopoly input" that is also sold to competitors who produce an equivalent retail service.

A. The prescription offered by Dr. Mayo involves the classic problem of imputation, a regulatory practice designed to prevent regulated firms that control an essential facility (which Dr. Mayo terms a monopoly input) from exerting a price squeeze on competitors in the downstream retail market whose only source of that essential facility is the LEC itself. In this market scenario, even though the LEC and its rivals can compete in the retail market, the critical ingredient or input needed to produce the retail service is assumed to be only available from the LEC and cannot be economically reproduced by its retail-stage rivals. Thus, imputation imposes a higher price floor for the retail service in this scenario than would be a simple price floor equal to the incremental cost of that service.

In this context, Dr. Mayo states [at 17]:

> [A]s long as the prices charged to competitors for inputs necessary to compete in telecommunications markets in Massachusetts are held above the incremental cost Verizon incurs in the provision of these services, a price floor that reflects only Verizon's incremental cost creates the very real prospect that efficient competitors will be artificially excluded from this market. On the lower side of the range, therefore, the minimum price should be based on the charges that Verizon imposes on its competitors for all of the monopoly inputs, plus Verizon's retailing costs.

To understand Dr. Mayo's suggestions in this context, it is instructive to examine the logic of imputation itself. Consider a hypothetical scenario in which an ILEC and a CLEC compete to provide the same *retail* service, e.g., basic residential service, but the most important *wholesale* input into that service, e.g., the local loop, is only available from the

ILEC, and cannot be economically reproduced (for various reasons) by the CLEC. Suppose that, besides that wholesale input, the retail service also employs certain retail-stage inputs, but that the incremental costs of the wholesale and retail inputs can be identified separately. With this background, consider the following notation for the prices and incremental costs involved in this scenario:

P_R	ILEC's price of retail service	P_W	ILEC's price of wholesale service
IC_R^{ILEC}	ILEC's incremental cost of retail service	IC_{RS}^{ILEC}	ILEC's incremental cost of retail-stage functions only
IC_W^{ILEC}	ILEC's incremental cost to provide wholesale service to itself	IC_W^{CLEC}	ILEC's incremental cost to provide wholesale service to CLEC

To fix ideas, it is useful to first note that the ILEC's incremental cost of retail service is the sum of its incremental cost to provide the wholesale service to itself and its incremental cost of retail-stage functions. That is,

$$IC_R^{ILEC} \;?\; IC_W^{ILEC} \;?\; IC_{RS}^{ILEC}$$

Next, consider what a profit-maximizing ILEC would likely do if it could count on two sources of contribution to profit: (1) the margin between the price of its retail service and the incremental cost of that retail service, and (2) the margin between the price it charges the CLEC for the wholesale service and its incremental cost to supply the wholesale service to the CLEC. In profit-maximizing equilibrium, it can be shown that these two margins would have to be equal. This would, in effect, leave the ILEC financially indifferent between pursuing profit from either its retail service or its wholesale service. This fundamental condition provides the root equation for imputation, namely, the "equal contributions rule"

$$P_R \;?\; IC_R^{ILEC} \;?\; P_W \;?\; IC_W^{CLEC}$$

This condition (particularly if the equality sign is replaced by the stronger "greater than or equal to" sign) can be shown to prevent any price squeeze of the dependent CLEC. From

this, the imputation price floor emerges by a simple re-arrangement of the equal contributions rule,

$$P_R \geq IC_R^{ILEC} + (P_W - IC_W^{CLEC})$$

In words, this says that, in the special market context in which the retail competitor is dependent on the ILEC for a critical wholesale input that it cannot itself reproduce economically, the ILEC's retail price floor must be above its retail incremental cost by at least the margin the ILEC earns from selling the wholesale input to the CLEC. To see how this condition relates to that suggested by Dr. Mayo, consider the following re-arrangement of the imputation retail price floor rule:

$$\begin{aligned} P_R &\geq P_W - (IC_R^{ILEC} - IC_W^{CLEC}) \\ &\geq P_W - (IC_W^{ILEC} - IC_{RS}^{ILEC} - IC_W^{CLEC}) \\ &\geq P_W - IC_{RS}^{ILEC} - (IC_W^{ILEC} - IC_W^{CLEC}) \\ &\geq P_W - IC_{RS}^{ILEC} \quad \text{only if} \quad IC_W^{ILEC} \geq IC_W^{CLEC} \end{aligned}$$

The general rule that emerges from this is that the retail price floor should be the sum of three items: (1) the price the ILEC charges the CLEC for the wholesale input, (2) the ILEC's incremental cost of its retail-stage functions, and (3) the *difference* between ILEC's incremental costs to supply the wholesale input to itself and to the CLEC. If that latter difference is zero, i.e., the ILEC incurs the same incremental cost for the wholesale input regardless of whether it is used by the ILEC itself or by the CLEC, then the last line of the condition above reduces the retail price floor, in essence, to Dr. Mayo's suggestion that "the minimum [retail] price should be based on the charges that Verizon imposes on its competitors for all of the monopoly inputs, plus Verizon's retailing costs." Thus, implicit in Dr. Mayo's suggested rule is the equality of the two incremental costs to supply the wholesale input. If that equality does not hold and, it costs *more (less)* to supply the wholesale input to the CLEC than to itself, then the ILEC can legitimately *reduce (increase)* its retail price floor by the amount of the margin between the two incremental

costs. Therefore, this important subtlety should be noted when considering Dr. Mayo's suggestion for a retail price floor when an essential wholesale input (available only from Verizon MA) is involved.

Q. Should, as Dr. Mayo contends [at 24-25], intrastate switched access rates have to be reduced to TELRIC levels, rather than to current levels of rates for interstate switched access?

A. No. If the objective is to eliminate any discrepancy between the rates charged for intrastate and interstate switched access services (which may differ jurisdictionally but are functionally equivalent), then mirroring, i.e., setting the same rates for both, is acceptable. The question is whether that reduction would produce economically efficient intrastate switched access rates in Massachusetts. That, in turn, raises the question as to whether current interstate switched access rates are themselves economically efficient. Recent FCC proceedings have established that current interstate switched access rates continue to provide contribution to universal service, although under the aegis of the *CALLS Order*, that contribution is being ratcheted down over time. Even if all contribution to universal service were eventually to be phased out, however, interstate switched access rates would likely remain obliged to contribute appropriately to the recovery of shared and common costs. The economically efficient levels of interstate rates in that situation would then depend on market conditions in two markets, the market for switched access service and the market for toll services.

The same set of considerations should apply to rates for Verizon MA's intrastate switched access service. Again, even if the need for that service to contribute to universal service is eliminated eventually, the requirement to contribute to the recovery of shared and common costs would remain. If mirroring were the policy, then intrastate switched access rates would reflect those in the interstate jurisdiction. If mirroring were not the policy, then rates for intrastate switched access should find their economically efficient levels through the interplay of market demand and supply conditions. In none of these scenarios should switched access rates be reduced *exactly* to incremental cost, unless market conditions deem otherwise. More particularly, the relevant measure of incremental cost can, and

should, never be TELRIC, which is reserved under the FCC's rules to be a measure of incremental cost for an unbundled network *element*, not a service.

Q. Does this conclude your testimony?

A. Yes.